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## ABSTRACT

This critical review of the literature on behavioral objectives is presented in four sections: definition of a behavioral objective; the function of a behavioral objective; consistent acceptable format for constructing behavioral objectives; and the pros and cons of behavioral objectives. The literature review reveals that current findings on the effects of instructional objectives provide no conclusive or consistent data on the relationship between the use of objectives and student learning, and it is suggested that there is a need to assess the behavioral objectives movement, to identify strengths and weakness, and to identify areas in which research is needed. A bibliography is appended. (Author/RAO)

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Behavioral Objectives: A Critical  
Review of Theory and Research

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## Abstract

Behavioral objectives provide the basis for systematic planning of instruction. This systematic approach enables the designer to work more effectively and it enables the learner to understand what is expected upon completion of the learning experience. There are, however, a wide range of views concerning the advantages of behavioral objectives. The purpose of this paper is to present a critical review of the literature on behavioral objectives. This paper is divided into four major areas: (1) definition of a behavioral objective; (2) the function of behavioral objectives; (3) a consistent acceptable format for constructing behavioral objectives; and (4) the pros and cons of behavioral objectives.

The literature review reveals that current findings on the effects of instructional objectives provide no conclusive or consistent data on the relationship between the use of objectives and student learning. Consequently, there is a need to assess the behavioral objectives movement, to identify strengths and weaknesses, and to suggest areas in which research is needed.

## Introduction

Behavioral objectives have been central to the concept of instructional systems development. They have now been incorporated into the designing of curriculum. They provide the basis for planning instruction. They have been used to tell learners what is expected of them upon completion of the learning experience. There is, however, a wide range of views concerning the advantages of behavioral objectives, as well as many varying opinions as to the technical aspects of how and for what purpose they should be used. Behavioral objectives provide a point of departure for a thoroughgoing attempt to improve instruction. By precisely stating in behavioral terms what the student should be able to do after the learning experience, the designer hopes to reduce any gaps between the desired outcomes of education and the intentions of the instructor. This approach has been criticized from both curriculum specialists and educational technologists. This paper is a critical review of the literature on behavioral objectives; it is divided into four parts: (1) determining a consistent definition, (2) a consistent acceptable format used for writing behavioral objectives, (3) the function of behavioral objectives, and (4) the cases for and against the use of behavioral objectives.

### I. Defining Behavioral Objectives

At first it may seem that defining objectives is really not a difficult task. However, educators experienced with curriculum development, course development, and those who have tried to develop procedures for evaluating students will attest to the fact that it is. Palmer (1974) feels that most educators make the task of defining behavioral objectives far too complicated.

This section of the report will be divided into five parts: (1) Defining Behavioral Objectives in Relation to Terminal Behavior, (2) Defining Behavioral Objectives in Relation to Subject Matter, (3) Operationalism and Behavioral Objectives, (4) Opposing View Points Concerning the Definition, and (5) Research Related to the Development of a Consistent Operational Definition.

#### Defining Behavioral Objectives in Relation to Terminal Behavior

Many educators have defined the term behavioral objective. Lindvall (1964) states that the process of developing behavioral objectives is basically one of facilitating communication. This is accomplished by choosing precise words and statements so that there is a clear and exact meaning for those reading the objective. Popham (1969) writes that whether these statements are referred to as objectives, aims, goals, intents, or outcomes is relatively unimportant. Whatever synonym is used, a behavioral objective should refer to an intended change which one wishes to bring about in a learner. Bloom (1956) defines objectives as being specific formulas that the educative process uses to change student behavior. Mager's (1962) definition of behavioral objective has probably influenced more educators than any other definition: an objective is a statement describing a proposed change in a learner; it specifies what the learner will be like when he has successfully completed a learning experience. For example, an objective written for a 5th grade science class using Mager's 3 characteristics of a well stated objective would look like the following: Given a battery, light bulb, socket, and pieces of wire, the student will be able to demonstrate the making of an electric circuit by connecting wires to battery and socket and testing the lighting of the bulb.

### Defining Behavioral Objectives in Relation to Subject Matter

A major consideration when one is defining behavioral objectives is that of determining what is to be learned by the learner. An educational objective has been described as one in which the learner's behavior is clearly and precisely specified in relation to the subject matter with which the learner is expected to deal. That is, the objective must specify not only the learner's terminal behavior, but also the particular aspects of the subject matter to which the learner must address himself in order that learning may occur.

Gagne and Briggs (1974) state that the first step in defining objectives is to identify the purpose of the course. This purpose should be concerned with what behavioral change will take place should the purpose of the course be attained. They also feel that these purposes should be stated as immediate outcomes of instruction, and not outcomes to be reached in the distant future. This process of identifying the purpose will help teachers to make clear statements of what they are trying to teach. Some teachers in the past have had a clear understanding of what was to be taught and what was to be learned by the student, and were able to translate this notion into relevant learning experiences without ever having put them down on paper. However, many other teachers have not carried their thinking beyond the point of selecting the content to be presented. They have not considered carefully what the students are to do with the information.

### Operationalism and Behavioral Objectives

Operationalism is a concept borrowed from the hard sciences. It is concerned with banishing ambiguity and obscurity from the language of science. By applying scientific concepts to concrete procedures one could avoid inconsistent and contradictory meanings. In the context of objectives it

refers to the process of defining abstract constructs or concepts in terms of a limited number of instances drawn from the three domains of learning: cognitive, affective, and psychomotor (Tiemann, 1977). Tuckman (1972) says an operational definition is a definition based on the observable characteristics of that which is being defined. In the field of behavioral research, operational definitions are formulated so that statistical methods can be applied. These methods produce reportable evidence and hard conclusions. The behavioral objectives approach requires that behavioral objectives be precisely stated in behavioral terms.

#### Opposing View Points Concerning the Definition

Some educators feel that there is difficulty with explicitly defining behavioral objectives. MacDonald-Ross (1973) points out that some of the problems encountered in the behavioral objective domain are extensions of the basic problems faced by operationalism. He states: "What exactly counts as an operation? What happens to the concepts when we are not performing operations or if we have not yet learnt how to perform them?"

Hempel (1958) says that the greatest advances in scientific systematisation have not been accomplished as a result of referring explicitly to observable behaviors, but rather by means of laws that speak of various hypothetical or theoretical attributes. He points out that activities, events, and attitudes which are not ascertainable by direct observation have an important and valid place in the educational system. For instance, in the fine arts it is extremely difficult to have an observable product when judgment, feeling, and creativity play such a major role. MacDonald-Ross points out that as far as art subjects are concerned, there are no ultimate goals to be reached, but rather standards of judgment and tastes to be developed. He also says that:

these broad goals in the arts do represent a type of behavior, which being internal is not observable. Eisner (1967) supports the positions that attitudes, values, and creative experiences are important educational aims which cannot be translated into behavioral terms. Burns (1972) feels that if the definition of behavioral objectives is concerned only with specific behaviors, there is no room for expansion, self discovery, originality, and whatever you might wish to call that which is subsumed under the general term "creativity."

#### Research Related to the Development of a Consistent Operational Definition

A series of studies (Barron, Gerlach, and Haygood, 1976, and Haygood, Gerlach and Wigand, 1977) deal with analyzing rater's perception of the components of behavioral objectives, rated both in isolation and within complete statements of objectives. These studies measured the degree to which the various components contribute to the raters' perceptions of the complete objective. These empirical studies have currently investigated the development of a consistent operational definition of the terms behavioral objective.

The results indicate clearly that no single component, the verb, direct object, condition, or standard, should be singled out as being of primary importance in determining the character of a behavioral objective. Investigators are moving closer towards a consistent operational definition of the behavioral objective, but additional research is needed that will limit the many discrepancies among educators concerning the definition.

## II Form

### Major Theorists Views on Form

Many articles and books have appeared in the professional literature concerning the proper form of behavioral objectives (Mager, 1962, Bloom, 1964,

Lindvall, 1963, Popham and Baker, 1970, and Kibler, Barker, and Miles, 1970).

Tyler (1934) suggests one should state the objectives in such clear and definite terms that they can serve as guide for constructing test questions. Many statements of objectives are so vague and nebulous that they prove to be glittering generalities which are of little value as guide in teaching and of no value in making examinations. Mager's (1962) three criteria for a well stated behavioral objective are probably the best known: (1) One should state the objective in terms of what the learner will be able to do after the learning experience. This is done by selecting verbs which describe observable actions. Such words as identify, describe, construct, and list are far less ambiguous than verbs such as to know, understand, or appreciate. (2) The second characteristic of a well stated objective is a statement of the conditions under which the performance is to occur. Conditions should be stated clearly enough that others understand your intent as you understand it. (3) The third characteristic of a well stated objective is the criterion, the quality or level of performance that will be considered acceptable.

Some educators feel that Mager's criteria for a well-stated behavioral objective have weaknesses. Merrill (1970) reports that Mager's criteria for a well-stated objective fail to distinguish the level of behavior. He states that there are more purposes to instructional objectives than transmission of knowledge and increasing proficiency. He also points out that there are two classes of conditions under which behavior is to occur. The first is concerned with those conditions related to a particular subject matter and unique to the testing situation. An example of a condition stated in a behavioral objective for a math class would be "...using only a calculator..." or "...using only the protractor..." The second is concerned with the psychological conditions which help define the behavior being observed. This second type is quite often

overlooked and is more important because the type of behavior being observed will change when psychological conditions are changed. In most cases the psychological conditions are not stated in the objective, but have an important effect upon its outcome. For example, the classroom learning environment is typically not normal the day before Christmas vacation. MacDonald-Ross (1973) feels that a fourth characteristic should also be considered when determining what constitutes a well stated objective: an objective should be relevant to the general educational aims of a course. He states, "No rules are given for achieving this criterion--which is actually the most difficult to achieve, yet the most important of all" (p. 12).

Gagné and Briggs (1974) agree with the three basic criteria set forth by Mager and later writers concerning a well-stated behavioral objective. Gagné and Briggs also state that the choice of verb in an objective is a matter of critical importance. They feel that there are two kinds of verbs which must be incorporated into an objective. The first verb denotes action. Verbs denoting action are not difficult to find. Common ones are, writes, draws, selects, matches, names, groups, verifies. There are many others as well. The following examples denote action: Without use of reference materials, state the provisions of the Fifth Amendment, in writing. While it may be essential for completeness of communication, is not necessarily the most important verb in the definition of an objective. The second verb, (i.e., the major verb) which they feel is probably of even greater importance in its implications, denotes learned capability. It has the purpose of communicating the kind of human capability one expects to be learned, as it may be observed in some performance exhibited by the student. The following verbs describe performances implying learned capabilities: discriminate, classify, demonstrate, generate, execute, originate, identify, and state. Several examples

that use verbs which describe learned capabilities are: "...states orally the major issues in the Presidential campaign of 1968," and "...identifies, by naming, the root, leaf, and stem of representative plants." Early writers regarded the verb as the primary determiner for which objectives were considered behavioral. Many writers provided us with lists of verbs. Not until Deno and Jenkins (1968) was there any empirical data collected regarding the verb and behaviorality. Deno and Jenkins selected a list of verbs from a well-known experimental curriculum. They had a group of elementary and secondary teachers rate the verbs on a five point scale of observability. The following results were reported by Deno and Jenkins "The results indicate that many widely used and recommended behavioral terms refer to behavior which is not regarded by teachers to be as clearly 'observable' as some have suggested" (p. 22). They concluded that verbs used in behavioral objectives are selected for usage rather than observability. Gerlach (1974) replicated the Deno and Jenkins study, by rating the same ninety-nine verbs. The results obtained by the study were basically the same as those reported by Deno and Jenkins.

#### A Closer Look at the Three Essential Characteristics of a Behavioral Objective

A verb which describes overt behavior is the main factor involved in stating clear descriptions of what the learner must do to perform the task. There are many verbs which could be used in behavioral objective statements. The following list is illustrative of widely used verbs: identify, name, describe, construct, state, discriminate, classify, generate, name, order, check, and perform (Sullivan, 1969, Deno and Jenkins, 1968, Gagné and Briggs, 1974, Gerlach, 1974).

The choice of verb in an objective is a matter of critical importance. The primary reason is the avoidance of ambiguity. The statement of an objective should communicate reliably, in such a way that two different literate people will agree on the specific behavior which is to be exhibited by the learner. Words such as "knows," "understands," "appreciates," do not communicate reliably. The action should be expressed in the objective so that anyone who reads it will be able to identify the same performance.

The statement of conditions which specifies the condition under which the behavior is to occur is the second essential characteristic of a well-stated behavioral objective. The conditions specify the limitations and restrictions which are imposed on a learner when, following instruction, he performs the task stated in the objective. Conditions describe the materials, events, information, and the objects in the learner's environment. Examples of stimulus conditions include the following:

"When presented with a typed list..."

"With the use of class notes..."

"Without the use of classnotes or other references..."

Ambiguity is reduced when precise limitations and restrictions are specified.

The third essential characteristic of a well stated behavioral objective is the statement of criterion, which describes how well the learner is to perform the task. The criterion or standard provides a basis for evaluating the prescribed behavior. For example, consider the objective "Name the four major food crops grown in Arizona." The standard is "correctly name all four major food crops grown in Arizona and only those four. Thus a performance standard is a specified level of achievement used to determine whether or not a task has been mastered satisfactorily. Performance standards help both teachers

and students know where any given student is in a program. Mager (1962) states, "When the minimum acceptable performance for each objective is specified we have a performance standard to use in assessing students' work:

Mastery generally means that the student will exhibit the performance 100% of the time (minus some small percent for "measurement error"). However, frequently it is appropriate to set a lower standard, such as three out of five problems solved correctly, or four out of six defects identified (Bloom, 1971). Briggs (1970) states, "Many people find the how well criterion the most awkward to include in a statement of objectives. But, for objectives requiring more complex evaluation, it may be easier to omit this third criterion from the actual statement of the objective, and present it in the scoring key, and grade conversion guide, showing just what standard of student performance will be considered acceptable."

Behavioral objectives do not state in quantitative terms what criteria will be used to determine whether or not the objective has been satisfactorily met (Gagne and Briggs, 1974). The objective does not say how many times the student is to "demonstrate the addition of whole numbers," or how many "errors" will be permitted. They do not state what will be needed for the observer to be confident that the objective has been met. Gagne and Briggs feel that there are two reasons why the criteria should not be included in the objective statement. First, the criteria specified in an objective is not likely to be applied in the same manner to all individuals. Second, the question of criteria of performance is a question of "how to measure," and is bound up with the techniques of performance assessment. At the point in the instructional planning when objectives are being described, it is confusing to become concerned with assessment procedure. The concept of mastery implied by the

objective statement is derived from an important theoretical viewpoint. The theory underlying Gagné's (1970) learning hierarchies accounts for the function of mastery. According to the theory, the achievement of an intellectual skill is important because it supports the learning of more complex skills. Strictly speaking from a practical view, Gagné and Briggs point out that it is not possible to predict in precise terms how mastery should be measured. They state, "It is not wise to adopt some arbitrary standard like five out of six correct responses. The criterion of mastery will vary with what is being learned, and needs to be determined as a part of the assessment process" (p. 89).

The roles of the three basic components of an objective, as stated by Mager (1962) have been researched by Barron and Gerlach (1974). Their results confirmed the importance of the verb in objectives, but they also found that the choice of conditions and criteria influences the rating of a complete objective. Haygood et al. (1977) state that "no single component, such as the verb, should be singled out as being of primary importance in determining the characteristic of a behavioral objective."

Some writers contend that form should be considered only as a function of an objective. There is little point in requiring a teacher to write an objective in standard form without taking into account the purpose for stating the objective (Harlen, 1972). This purpose should provide the basis for teachers to make decisions in their everyday work in guiding learning in the classroom. Of course there will be a variation from one teacher to another as to the form of expression. Harlen states, "The form in which the objectives are stated must also be left to the teachers; trying to specify them in the detail advocated by Mager may be of help to some in encouraging clarity of thought, it may be unnecessary for others" (p. 234).

Instructional, or classroom, objectives are primarily the responsibility of teachers and cannot be determined by anyone else (Harlen, 1972). Unfortunately, teachers are frequently untrained in the use or formulation of behavioral objectives in which case outsiders suggest examples or provide guides to defining objectives. This may do as much harm as good if teachers accept others' objectives as their own, or if they go through a superficial training which teaches them the form but not the philosophy behind the concept of objectives (Marlen, 1972).

Many teachers are now being given the opportunity to implement a developed objective based instructional program. Niedermeyer and Sullivan (1977) state that teachers do have the option of accepting or rejecting an objective based program on their judgment of the worth of its objectives and resources for their pupils. There is no explicit requirement that teachers are to use all the materials that have been developed for them, or closely follow the recommended instructional procedures. The intention of the teacher and the program, however, is to produce successful pupil performance on the objectives. To reach this goal teachers should use whatever resources and creative abilities they have.

### III Function of Behavioral Objectives

The functions of behavioral objectives can be divided into four categories: (1) aid in design of developing efficient instructional programs; (2) provide guidance in evaluation of instructional programs; (3) facilitate learning for students; and (4) inform teachers, administrators, and general public of the purposes of the instructional program.

Aid in Design of Instruction. Objectives offer a systematic means of

planning in education. When designing a program or system, one needs to know what a successful solution will look like as well as what criteria it must satisfy. MacDonald-Ross (1973) implies that behavioral objectives can provide the only possible rational basis for evaluating the success of the learning experience. The course becomes successful only if the students can demonstrate satisfactorily what the objectives predict.—He also states that objectives indicate how the process of teaching should be conducted as well as help to assist in the selection and design of instructional activities.

A systematic procedure for developing instruction has been developed by Gagné (1974). He states that when objectives are known, one is able to infer what kind of learned capability is being acquired, and one can also determine what conditions will be needed to bring about the learning with greatest efficiency. Clearly, then, the systematic design of lessons which make up courses will result in the development of a sizeable collection of statements of objectives. This collection of objectives will be constructed by using such schemata as Bloom's Taxonomy (1956) or Gagné's learning hierarchy (1970). Higher level objectives will be formulated which will depend on the acquisition of lower level objectives. These lower level objectives will be stepping stones or prerequisite skills that will have to be mastered before the higher level goal or objective can be achieved. Thus the specification of prerequisite skills should provide a complete description of those previously learned skills needed by the learner in order to acquire the new skill most readily. The identification of performance objectives makes possible the classification of capabilities into useful categories. Without these categories, we can deal with learning principles only on a very general basis. With them, it becomes possible to infer what kinds of learned capabilities are being acquired at any

given point in the learning process. One can also determine under what conditions (internal as well as external) the learning experience takes place. This knowledge may increase the efficiency of one's instruction.

Instruction is to be designed with reference to performance objectives and the prerequisite capabilities they imply. The first necessary component in the design of instruction is to classify the lesson as having a particular type of learning objective. Along with specifying objectives, two other components are included in the design of instruction. One is developing methods, designing materials, producing media, and developing learning experiences or exercises; the other is evaluating the success of the learners after the instructional process. Mager (1968) describes the three components of instruction in an easy to remember format: (1) Where am I going?, which refers to how to achieve the objectives; (2) How will I get there?, which refers to how to achieve the objectives; and (3) How will I know when I've arrived?, which is the evaluation process of determining whether or not the student has satisfactorily achieved the objective. These three questions can be used when planning instruction.

One does not have to proceed in any given order when developing the three components. MacDonald-Ross (1973) feels this would be entirely too mechanical a view of the procedure of instructional design. Rather, he suggests that the designer should do his best in developing objectives, then move on to considering the end-of-unit tests, and then select and develop the instructional materials. This procedure would be carried out until one felt that each component had been specified as clearly as possible. At this point one would develop a first draft; quite frequently there will be changes in some of the objectives. But of course one would be doing this on the basis of some evidence rather than on the basis of some vaguely conceived or haphazard

scheme. One should realize that although objectives are intended to be a basis for prescribing course structure and evaluation, frequent adjustments must be made in practice.

There are varied viewpoints concerning the advantages and disadvantages of using behavioral objectives in instructional design. Baker (1974) for example, feels that the use of behavioral objectives in forming a basis for restructuring instructional programs may have some negative consequences. Because objectives are stated in operational language, they appear to be more teachable. Objectives may look achievable if they follow the formula: "Given...the student will be able to...", but such is not always the case. Because it is easy to transform goals into the accepted behavioral objectives format, examples of learning may be casually produced. Baker states that many supervisors and curriculum specialists feel that as long as the behavioral verb has been supplied, there is little to criticize. She also states that "most behavioral objectives do not present sufficient cues regarding what a teacher should alter in instruction in order to facilitate improved learning."

Objectives help as a stimulus to clear thinking by forcing the teachers to think in specific terms rather than in vague ambiguities. MacDonald-Ross (1973) feels that this is a prerequisite for any system of design or planning and that such thinking yields the additional benefit of revealing value judgments that might otherwise remain concealed. Once externalized, such thinking can be subjected to criticism and testing, and thus instruction can be improved. Since objectives can provide a stimulus for clear thinking, they can help teachers in developing instructional goals, strategies, purposes, and methods. Kibler, Cegala, Parker, and Miles (1974) suggest that if teachers state their instructional intent in behavioral objectives, other teachers will be able to

understand what content is being covered within their classroom.

Although there is not complete acceptance among educators of the specific use of behavioral objectives in designing instruction, it can be agreed that behavioral objectives can provide guidelines for teaching and can lay the foundation for a systematic approach for curriculum planning.

Guidance in Evaluation of Instruction. Objectives are useful in the evaluation process. Gagne (1970) states that descriptions of objectives are descriptions of what must be observed in order to verify that the desired learning has taken place. Consequently, statements of objectives are used for assessing student learning. Teachers may use objectives to design situations within which student performance can be observed; or objectives can be used as a basis for test construction. While objectives can be used as a basis for evaluating students, they can also be used as a basis for evaluating instruction. Since objectives are directly related to instructional content, and since they include a performance standard, both the student and the teacher can know the quality and quantity of a successful performance. If students constantly fail to meet the standard specified in the objective, this can help the teacher to evaluate either the instructional content or activities that are related to the objectives not being attained by the students. Revision of the instructional content and/or activities may be needed at this time. Kibler et al. (1974) feel that there are primarily three functions of evaluation in instruction: (1) student achievement of instructional objectives; (2) evaluation of instructional materials; and (3) evaluation of the instructor. Kibler goes on to say that while both norm-referenced and criterion-referenced testing can be used to provide information concerning the three functions, criterion-referenced testing is best suited for accomplishing functions one

and two, and norm-referenced testing is best suited for function three. It is extremely important that teachers be able to determine the student's level of achievement at any time during an instructional program. This can be done very effectively by keeping an accurate record of the students' progress on each performance objective throughout the instructional program. When teachers have this type of information, they will know how the student is performing at any time and they will be able to pinpoint any weaknesses in learners.

Evaluation can occur throughout the instructional process. Briggs (1970) states that tests over competencies of an objective are useful for determining whether or not students need additional remedial work. They also are a useful source for pinpointing trouble when a student fails the test of a specific behavioral objective. When tests are given for specific objectives, then can serve as a guide for the teacher in determining whether the student is ready to go on to the next objective. Tests for units of instruction can reveal the learner's mastery of more complex objectives. End-of-course tests can indicate the students' ability to solve more complex problems or to apply their knowledge to a wider range of situations. Gagné (1974) feels the pre-tests based upon criterion objectives can also help to identify students who have acquired the level of performance before instruction begins. Such objectives may also help in identifying students who lack the pre-requisites to satisfactorily meet the criteria set forth in an objective.

Teachers have few rules to go by when writing test items; selection of content is often haphazard. Consequently, when teachers are faced with a student who has not satisfactorily met the objectives, they often have difficulty in selecting content for practice items. Teachers usually guess, after inspecting the test, what relevant class of examples they may use that will

correspond to the objective. Baker (1974) feels the answer to providing data to facilitate improvement of instructional programs lies in domain referenced testing. This type of testing can supply both the data needed for assessment of instructional programs and information suitable for feedback to teachers to facilitate planning. The use of domains in the design of tests helps reduce the production of trivial objectives. A domain consists of a subset of knowledge, skills, understanding or attitudes where the essential elements of the content, in which the student is expected to acquire, is carefully described. Baker states, "domains for teaching and testing represent an attempt to find a reasonable compromise between vagueness and over-precision" (p. 11). Domain require the teacher to focus on the range of eligible content to which the learner's skill is to apply. Designation of content rules represents the major difference between domain-referenced testing and objective-based evaluation. Content limits provide a set of rules to describe what content is appropriate to include or to sample in the test on instructional examples. The content limits describe the range of content to which the learner is expected to respond.

Referring again to the three components in the design of instruction (see p. 15), it can be seen that instruction is cyclical. That is, the three components are in constant feedback loops. Not only does the finished product get tested and revised, but even the objectives themselves are subject to revision. The result of such cycling is that the objectives, course content, and tests may eventually form parts of an interlocking system, where changes in one part will require adjustments in the other two parts. The advantage here is that the system can continue improving over a period of time.

Facilitates Student Learning. When behavioral objectives are given to students prior to the instructional content which is to be presented, they provide guidance to the student in the processing of information. Deterline (1968) says that if students are told precisely what the objectives are, in the form of minimum performance requirements, and if they are given sample test questions, performance can be improved. Behavioral objectives provide goals which are definable and assist in guiding the teacher in developing student activities. If behavioral objectives are used to tell the student exactly how he is going to be tested, the threatening aspect of the test will probably be reduced. Testing is a means by which students can check on their progress, or as a tool which the teacher uses to help them progress. By providing the objectives to the students one is communicating to the students what they are to do, to achieve satisfactorily. Kapfer (1970), too, advocates presenting behavioral objectives to students. He says that if students are given objectives they will be able to make intelligent choices concerning how they will attain them. In the past, students have not had this opportunity. Kibler et al. (1974) state that it seems reasonable that students who are presented with behavioral objectives are spared the frustration and time-consuming effort of trying to guess what the teacher expects of them. It also seems logical that students will learn more if they are told what is expected of them and how they will be expected to demonstrate that they have satisfactorily met the objective.

There are several more reasons for providing objectives to students (Duchastel and Merrill, 1974). The first is that behavioral objectives may provide direction to students' learning. Since they will know exactly what is expected of them, they will be able to discriminate between relevant and

non-relevant material. The second is that objectives may provide some organization or general structure to the content or subject matter. Duchastel and Merrill also point out that objectives may serve a management function by enabling the students to better organize their time and learning experiences in terms of the goals of the course. This might help eliminate the typical cramming sessions which often precede tests. Another function is that of providing learners feedback in terms of the criteria set forth in the objective, enabling students to deal with any discrepancies between performance and goal. Finally, presenting objectives to students may help to motivate them. Students who know that they have satisfactorily met the criteria set forth in the objective will probably be more motivated than students whose only reinforcement comes from a grade at the end of a course. Duchastel and Merrill also point out that presenting objectives to students will have no results if the students pay no attention to them in the learning situation. Therefore, teachers must make an effort to thoroughly explain the meaning of objectives to students so that they will actually use them while learning. A discussion on the form and function of behavioral objectives would be helpful. However, teachers must be careful not to give long and extensive lists of objectives to students. This may overwhelm and confuse them. Such a list would defeat its own purpose.

Gagné et al. (1974) agree that the advantage of providing objectives to students is that it informs the learners of their goal. Gagné disagrees with those who contend that when one communicates an objective to students, they may be inhibited from trying to meet still other objectives which they may formulate themselves.

Informs the Teacher, Administrator, and the Lay Citizen of Purposes of Instructional Program. Accountability in education has gained acceptance from both the public and the federal government. With the growing involvement of parent groups in making decisions about local educational systems, it is clear that some form of accountability is needed. The public should be aware of the exact nature of what learning and schooling are all about. This type of accountability is becoming a more frequently discussed issue in education. Taxpayers, parents, funding agencies, and legislators are all extremely interested in having some type of proof that education in fact is taking place in our schools. Are schools really doing what they say they are doing? Why should any educator try to cover up what is being taught? How and what should "Johnny" know and do by the end of the school year? The answer to these questions is quite simple and straightforward: Specify the objectives, which in turn will inform these people about what we are doing and how we can prove it. To achieve the balance between spending and student learning that accountability demands, the teacher and school system must show evidence that students have learned as a result of their instruction. Educational accountability can be demonstrated successfully only when educational goals and objectives are precisely identified and stated. Kibler et al. (1974) say that the use of instructional objectives will allow teachers to convey their goals to their supervisors and school boards. Burns (1972) suggests that specifying what is to be learned is obviously the function of objectives.

In order to defend budgets or requests for funds, administrators and teachers can provide the content of courses in objective form to the school board and thus demonstrate the need for expenditures to the board in more concrete terms. This process is much better than trying to provide verbal or

verbal-pictorial representations of learning situations as they really exist, because board members are often too far removed from the classroom. Thus, instructional objectives may provide a basis for logical, concrete reasons for spending money. Scott (1974) states that objectives can also be used to explain to parents or to the community the philosophy on which a given course of instruction is based. Parents are often neglected in the educational process. However, parents are becoming increasingly concerned about the quality of education in the schools and are becoming more involved in the educational process. A list of objectives could be sent home to the parents telling them which objectives their child attained. Parents could then evaluate the progress of their child at intervals during the year and check to make sure that their child is keeping up. This would help inform parents about the content being taught as well as the child's growth in the program. These objectives could also inform parents of the child's weaknesses and strengths. Such a procedure would be quite an improvement over the report card procedure commonly used.

There appear to be at least two advantages to the use of objectives in most teaching situations. First, objectives prompt teachers to determine the most significant aspects of the subject matter to be learned. The second is that objectives aid in establishing criteria for the measurement of classroom achievement. Since instructional objectives require teachers to specify criteria for acceptable behaviors and to determine in advance how satisfactory performance will be measured, teachers can achieve an increased sense of security. They feel more secure in their position and more satisfied with their professional contribution when they are confident in teaching the subject matter, confident of the subject matter's importance, and confident that the

measurement techniques will measure whether or not the objectives have been met satisfactorily.

Instructional objectives are important at two levels of administration. The administrator who is in charge of curricula relies on objectives to insure that content and subject matter are covered adequately and that subject matter between courses does not overlap or become redundant. Instructional objectives also promote a thread of continuity among related courses. Instructional objectives developed by teachers give the supervising administrator insight into the teachers' philosophy and course goals. Teachers can collect data to determine the effectiveness of their instructional program and if students are continually failing to meet the standards set forth in the objectives, it may be a result of poor instruction. This in turn will enable administrators to more effectively evaluate teachers.

#### IV The Cases for and Against Behavioral Objectives

The Case for Behavioral Objectives. Since the time Mager's (1962) classic book on Preparing Instructional Objectives provided a major stimulus to the use of behavioral objectives in the field of education, two distinct schools of thought emerged, the first arguing the case for the use of behavioral objectives, and the other against the use. In arguing the case for the use of behavioral objectives in education, a large number of claims have been made. Proponents of the use of behavioral objectives maintain that behavioral objectives clearly indicate to students what is required of them, and as a result, student performance improves (Gagné, 1970, Mager, 1968, Popham et al., 1969, and Tyler, 1964). Objectives can also provide communication between the teacher and the student. Students become aware of where they are going and what is expected of them when objectives are given to them. Objectives work

as an organizer. A considerable number of studies collected empirical data which indicate that giving objectives to students prior to instruction will enhance student learning. Dalis (1970) demonstrated that by using precise instructional objectives in advance of instruction enhanced learning of high school students in a health education class. The study implies, however, that objectives must be stated in precise terms, otherwise their value to the learning situation is doubtful. Doty (1968) investigated the effect of presenting objectives to students in a reading class. The results showed that the students who had prior knowledge of the objectives scored significantly higher on a posttest than did students who did not have prior knowledge. Lawrence (1970) studied two groups of students in a nursing care course, while Engel (1968) studied two groups of students in a mathematics course. Both studies reported that the group who received the behavioral objectives prior to instruction performed significantly better on a posttest. Blaney and McKie (1969) divided sixty volunteers into three groups, a behavioral objectives group, a general introduction group, and a pretest group. The results showed that the behavioral objectives group did significantly better than the introduction group on a posttest. The results also showed no significant difference between the pretest group and the behavioral objectives group on a posttest. Students in a college economics class were divided into two groups. One group received the behavioral objectives and the other did not. Tieman (1968) reports that by using retention scores as criterion, the behavioral objectives group scored significantly better than the non-objectives group.

There are also several studies that have shown no significant differences between groups of students who have received behavioral objectives and groups who have not (Boardman, 1970, Smith, 1967, and Weinberg, 1970). Therefore,

the generalizability of providing objectives to students prior to instruction is not easily determined. The evidence reported here demonstrates the complexity of the issue. However, it has been shown that objectives sometimes help and are almost never harmful. Therefore, if the provisions of objectives are relatively inexpensive, one might as well make them available to students (Duchastel and Merrill, 1973).

Another reason for using behavioral objectives is that they serve as operational aids, basically because they are designed in terms of action (MacDonald-Ross, 1973). That is, they act as a medium of communication or a mechanism for informing people. Curriculum design is developed by the team approach quite often in our schools. By using well specified guidelines, in the form of behavioral objectives, each team member will know exactly what is being asked of him. Thus, the division of labor can become a much easier task.

A third claim for using behavioral objectives is that by specifying the exact behaviors one wants the students to exhibit, the teacher is better able to select appropriate learning activities or to design and suggest alternative instruction strategies appropriate to the individual learner. By constructing objectives that meet Mager's criteria for a well stated behavioral objective, the teachers will be guided in their choice of selecting instructional activities that will be specific, precise, and relevant to the desired outcome. Because of the systematic approach to instruction that behavioral objectives afford, the teacher can also pinpoint, at any time during instruction, those students who may be experiencing difficulty in achieving the objective. Thus, the teacher will be able to design and suggest alternative instruction strategies appropriate to the individual learner. In this sense, the use of

behavioral objectives serves as an operational aid for the teacher in providing individual treatment for students. Because the outcomes of objectives can be replicated, treatment can be individualized. This means that students with different entry characteristics are recognized and remedial work can be provided for those who may need it. Tests developed on the basis of objectives, provide the teacher with diagnostic capabilities. MacDonald-Ross (1973) states that individualization may also mean that students can choose their own way to reach the objectives. For example, they might form contracts, which are written agreement between the teacher and student, to teach the goal or objectives specified by the teacher.

Clear and well sequenced objectives are necessary for individualization of instruction. Through testing, the teacher identifies where the child is academically at different times in the instructional program. Piper (1977) points out that frequent re-evaluation is needed in order to continue moving the child along in the instructional sequence. Careful and frequent recording of student progress is needed to facilitate the quality and accuracy of individualized instruction, as well as allowing for the evaluation and continued improvement of teaching techniques.

A fourth claim for using behavioral objectives is that they play a major part in the Objectives Based Instructional Programs that are being implemented in our schools. Classroom verified objective based programs have the potential for enabling teachers to provide students with the sufficient amounts of practice, feedback, and self correction needed to acquire competency on objectives is still very new to many teachers. Therefore, objective-based programs are assisting teachers in successfully promoting pupil attainment of the objectives by providing guidelines for effective teaching procedure.

However, the time that the teachers use to develop the instructional materials and procedures so that there is a high level of pupil achievement on the objectives requires extensive amounts of time, money, and expertise. Sullivan and Niedermeyer (1977) point out that if teachers want students to achieve mastery of objectives, teachers must also be provided with instructional materials and procedures developed especially for the objectives of the lesson. They go on to say that merely providing behavioral objectives to the teachers will have little effect on the learning situation. Teachers should not be accountable for high levels of pupil performance on objectives without the proper development of instructional materials and procedures. Sullivan and Niedermeyer conclude that with the increasing rate of objectives based programs in our schools, there is need for empirical evidence to support the concept of Objective Based Instructional Programs.

A fifth claim for using behavioral objectives is that they provide useful information for evaluating curriculum planning. Objectives guide the teacher and student in the teaching-learning process and they provide a measure against which progress can be judged. If teachers are to improve their teaching, they must have information that determines the success of different teaching methods and strategies that are used in instruction. Well-stated, clear objectives help provide this information. The information concerning curriculum planning evaluation is analyzed by using either norm-referenced or criterion-referenced testing procedures. Norm-referenced testing compares an individual's performance with that of a normative group. The standard in this type of testing is comparing a particular student's score with how other individuals performed on the test. On the other hand, criterion-referenced evaluation procedures are designed to determine whether a student has achieved mastery

of a behavior as specified in an instructional objective(s). In criterion referenced testing the interpretation of a student's score performance is in no way dependent upon the performance of other students. Criterion-referenced procedures assume that if instructional objectives are important, teachers should be concerned with whether students have achieved them, not with how much they achieved relative to their peers. Objectives help to provide information on student achievement throughout the unit of instruction as well as the end of the unit. Kibler et al. (1974) point out that criterion referenced testing is used for at least four different types of testing purposes: (1) for pre-assessment purposes, (2) for formative testing--to check on the progress of students so that assistance may be provided when necessary, (3) to determine whether components of instructional model need modification, and (4) to determine whether students have achieved the criterion levels of objectives at end of instructional unit. Teachers can determine whether students are ready to go on to higher order objectives or more complex objectives by evaluating lower level ones. Accurate assessment of what each student can and cannot do is critical for good teaching. It is a waste of time, as well as frustrating, to tell students what they already know about the content being presented or to present information that is "over their heads." Teachers have difficulty determining where their students are in the instructional process. With objectives clearly in mind, much of the guesswork is eliminated. When students see that they have achieved a satisfactory performance on lower level objectives, they are encouraged to further effort. Clearly stated objectives motivate both teachers and students.

Behavioral objectives may be informative in regard to curriculum planning. Bruton (1974) has done research on whether or not behavioral objectives would

provide information for curriculum planning. The researcher evaluated a widely used set of oral language objectives from the Distar Language I Program (Englemann, Osborne, and Englemann, 1969) for use with first grade children. The results showed that fifty-four of the eighty-five objectives were shown to be useful in relation to instruction. The results also indicate that thirty-one of the objectives were not applicable for classroom use. Thus, the research cited shows that objectives can be used for guiding student learning.

The Case Against Use of Behavioral Objectives. Not all educators, by any means, favor the use of behavioral objectives. One concern is that of the origin of objectives--how are they derived? MacDonald-Ross (1973) states that there is no consistent view among educators as to the origin of objectives. He feels that two schools of thought have emerged concerning methods for deriving behavioral objectives. One group attempts to provide explicit rules for converting observable human action into behavioral objectives. MacDonald-Ross refers to this group as the "hardliners." They do not agree with the distinction between knowledge and skills and between education and training. The hardliners believe that one can observe a "master performer" at a task and be able to prescribe educational objectives. MacDonald-Ross feels that the task analysis procedure might be effective for skills but inadequate for general education. For example, trying to specify the objectives for a course in engineering by observing master performers would be quite fruitless unless you were also willing to take into account the network of knowledge and understanding underlying their actions. MacDonald-Ross states "the hardline case thus seems to fail. It is not sufficient to use observations of action (whether of action at work, or during examinations) for a prescription of educational objectives, if one takes the meaning of the word 'education' at all seriously."

The other group fully accepts that educational objectives need to be derived in a way which does justice to the difference between education and training. This group is constantly trying to justify the use of behavioral objectives in instruction. MacDonald-Ross (1973) refers to this group as the "softliners." Popham and Baker (1970) state that objectives are derived from three sources: (1) the learner, (2) the society, and (3) subject matter. They propose that philosophy of education and psychology of learning can help one formulate general objectives which can then be developed into precise instructional objectives. MacDonald-Ross feels that Popham and Baker's philosophy is frankly "hilarious" since it is far from being an operational procedure for deriving behavioral objectives. All the critical decisions seem to be left to intuition and common sense of the teacher. This does not reflect the concept of a systematic approach.

Many research studies in the area of behavioral objectives suffer from the lack of a precise operational definition of what a behavioral objective is. Duchastel and Merrill (1973) and MacDonald-Ross (1973) state that there is a lack of specificity in relation to determining whether objectives are behavioral or non-behavioral. Several studies indicated that some educators use Mager's three criteria for a well stated behavioral objective when defining the objectives, others did not. Some studies gave examples of well-stated objectives, while many others did not. This lack of operational definitions of the objective variables makes it difficult to compare studies.

The level of specificity needed in constructing behavioral objectives is another concern in the use of behavioral objectives. MacDonald-Ross (1973) states that there is an absence of rules for deciding what level of specificity objectives should be developed. General objectives have a tendency to become

vague and ambiguous. In trying to eliminate ambiguity, one runs the risk of writing an impossibly long list of objectives. Wight (1973) states that when teachers begin writing objectives for what they hope to see as a result of instruction, they often write a behavioral objective for each intended outcome. This can result in a list so long that it is more an obstacle course than an aid to learning for the student. Wight also states that meeting the specification for a properly written objective often inhibits productive thinking. Teachers get so caught up in the mechanics of writing behavioral objectives that they lose sight of their priorities, namely, what they are really trying to teach. MacDonald-Ross (1973) concludes that "every time behavioral objectives have been constructed on a large scale this problem of specificity has proved quite fearsomely difficult." He feels that no satisfactory rules have emerged and perhaps the problem of specificity is insolvable in principle. Woodruff and Kapfer (1972) state that the level of specificity in constructing objectives has seemed to transform education into a mechanistic program devoid of real human value. They point out that one of the most compelling critics of behavioral objectives, Charles Silverman (1970), states "Indeed, the approach to instructional technology that most researchers are following (based on precise, measurable, behavioral terms) is likely to compound what is wrong with American education--its failure to develop sensitive autonomous, thinking, humane individuals" (p. 196).

Triviality is another criticism of behavioral objectives. In trying to satisfy the requirements of a properly written behavioral objective, teachers quite often find themselves listing inconsequential student behaviors and overlooking important ones. Meaningful objectives are more difficult to state in prescribed form. Pascal (1975) states that many educational goals which can be

expressed in behavioral objective form are trivial, with the result that important outcomes of education are under-emphasized. Popham (1968) states that by going through the process of constructing explicitly stated objectives, educators can identify and weed out the trivial goals; then they can begin paying attention to more meaningful educational objectives. MacDonald-Ross (1973) states that while Popham's response that trivial objectives can be weeded out once revealed may be true, it still avoids the "huge" problems of origins and operationalism. He feels that the problem of triviality is still a problem.

One of the most fundamental problems with behavioral objectives is that the objective itself is confused with the indicator (means of determining whether the objective is achieved (Wight, 1973)). A behavioral objective is a statement of a measurement to be taken, under specified conditions with criteria for evaluation to act as evidence that the desired behavior has been achieved. Many educators suggest that one should write a general statement or goal first. Then behavioral objectives can be written which relate to the general statements. But the general goal is often lost because of the focus on the behavioral objective; too much attention is devoted to the present performance specified in the indicator as opposed to the future capabilities called for in the general goal. Special effort should be made to relate the indicator to the goal. If this does not happen the student may find little meaning in the specification of performance.

Behavioral objectives frequently do not take into account that there may be many ways of assessing whether an objective has been achieved. This is particularly true when dealing with higher order cognitive objectives or objectives in the affective domain. An additional criticism of behavioral objectives is that they do not specify the measurement to be used. There are

frequently many opportunities for assessing the behavior demonstrated within a learning activity and some of these may be better than those specified in the behavioral objective. It may be argued that behavioral objectives do not prevent educators from seeking other evidence to verify that the behavior has been achieved satisfactorily. But the point is that a well-stated behavioral objective has a measurement component that is explicitly stated, which causes the teacher not to look further for additional evidence that the objective has been achieved.

The question arises as to which behaviors or products of behavior can be accepted as valid for the purpose of objectives? Harlen (1972) states "behavior, by definition, is observable, but two observers would not always agree on the same interpretation of a particular item of behavior" (p. 226). Some behaviors may be observed only under certain special condition. Are these described behaviors to be restricted to those objectives that can be observed and objectively judged only under certain condition? Harlen points out that observable behavioral changes are only sampled; and that indications that a change in behavior has taken place can never be a certainty. He feels that there is a blurred line between what is accepted as observable and what is not. Taba (1962) feels that deciding whether or not the criteria of the objective has been reached is less important. Harlen feels that the standard of acceptable performance in a behavior objective should not be rigidly applied and that some "slack" should be allowed, otherwise there is a potential drawback in specifying behavioral objectives with explicit criteria.

Some educators are expressing a distaste for the whole process of defining objectives. Sheehan (1974) states that advocates of behavioral objectives have become overly zealous and preach their message with a vengeance. Eisner (1967) states that many educators feel that the specification of objectives encourages students to seek the line of least resistance

and thus lower their own educational goals. Other educators feel that there are important educational aims which cannot be translated into behavioral terms--attitudes, values and the creative experiences. Still others feel that the heavy emphasis on behavioral objectives implies training rather than education. Some educators believe that the behavioral objective movement will sterilize education. Sheehan (1974) states "The attempt to package, to circumscribe, and to modularize materials for the consumer is seen as counter-productive. It is in direct conflict with the more important goals of teaching students to identify their own educational requirements, to decide what they would like to learn and what is important to them within the limits of what is available and their own abilities." He goes on to say that the student must be able to learn on his own with the help of the following tools: books, films, television, journals, colleagues, his own observation, and the teachers. He must derive from them what is important without the aid of superimposed instructional objectives. Sheehan feels that behavioral objectives advocates have pushed their views too zealously and tend to see objectives as ends in themselves rather than as being only a small part in the instructional process.

A final criticism by educators in regard to use of behavioral objectives is that it takes an enormous amount of extra time and energy to formulate and use them. Conroy (1973) points out that most commercially produced instructional programs that do provide behavioral objectives describe outcomes that are usually limited to lower level skill capabilities. As a result, teachers are forced to write most of the objectives for the programs. Teachers feel that their role is becoming one of a clerk whose role is to mechanically grind out behavioral objectives. Conroy also feels that even though there is broad

agreement about the benefits of using behavioral objectives in education, relatively little use is being made of the systematic process of developing instruction, and that rarely does a total school system manage its entire instructional program by behavioral objectives. He concludes: "The fact of the matter is that the vast majority of American teachers just do not use behavioral objectives as a part of their professional practice."

### Conclusions

Although there are several logical reasons for using instructional objectives, there is limited empirical data to support their use. Kibler et al. (1974) point out that there are only about fifty or so experimental studies focused on instructional objectives. Unfortunately, the results of these studies are inconsistent. They also provide no conclusive evidence about the effect of instructional objectives on learning. Kibler states "of the thirty-three studies found that compared student learning with and without possession of instructional objectives." Current findings on the effects of instructional objectives provide no conclusive or consistent data on the relationship between the use of objectives and student learning. We are unable to draw any conclusive generalizations about the effect of behavioral objectives.

It was the purpose of this paper to present a review of the literature concerning the definition, form, function and the cases for and against the use of behavioral objectives. It is clear that there are many different definitions of the term "behavioral objective." Additional development is needed in this area so that a consistent operational definition of the term behavioral objective can be formulated. Although Mager's criteria for writing a well stated behavioral objective is the best known, literature reveals that there is little agreement as to which characteristic of the behavioral

objective is most important, while others think that the standard or condition is. Gerlach et al. (1977) indicate that the choice of direct object also influences the observability and precision of a behavioral objective. They also contend that no single component is consistently of primary importance in determining the proper form of a behavioral objective.

Aside from the problem of determining the correct form of a behavioral objective and the need for training educators to write in an acceptable form, the literature suggests that educators must also be presented with the philosophy behind the concept of behavioral objectives. The basic characteristics of a behavioral objective are not fixed. Educators are not looking for objectives that are a particular size and shape, but are looking for objectives that are clearly stated and convey our instructional intents as concisely as possible.

Although there are disagreements regarding the definition and form of behavioral objectives, the literature reveals that behavioral objectives can have important functions in the instructional process: (1) aid in the design of instructional programs, (2) provide guidance in evaluation of instructional programs, (3) facilitate learning for students, and (4) inform teachers, administrators, and general public of the purposes of the instructional program. The major disagreements lie in the very nature of the behavioral objective movement itself. There is a wide disagreement as to the advantages of using behavioral objectives. MacDonald-Ross (1973) is one of the major critics, stating that "behavioral objectives will never achieve all that their supporter hope, for they are limited by the very presumptions on which they are based."

As an advocate for the use of behavioral objectives in education, I will conclude with the following impressions that I have drawn from review of the

literature.

1. There is a need to generate explicit principles for constructing relevant behavioral objectives. Rules for specificity of objectives need to be developed.
2. Behavioral objectives form a well-worked out method of rational planning in education. They encourage educators to make explicit the values they may have never revealed as well as making them think and plan in detailed, specific terms.
3. Behavioral objectives help to better organize the students' time as well as give them direction and provide motivation.
4. Behavioral objectives can form the basis for a well-worked out program for individualizing instruction.
5. Behavioral objectives are the clearest verbal devices available to educators for use in communicating the intent of learning programs to students, administrators, and general public.
6. Behavioral objectives can provide direction and guidance to teachers when they are choosing instructional activities and materials for a learning program.
7. Behavioral objectives provide a rational basis for evaluating instructional programs. Even with the high "costs" attached, the cyclical approach to evaluating instructional programs is worthwhile. Good instruction is not developed overnight and without expense.

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